ABSTRACT

A drilling control system provides, in one aspect, advisory actions for optimal drilling. Such a system or model utilizes downhole dynamics data and surface drilling parameters, to produce drilling models used to provide to a human operator with recommended drilling parameters for optimized performance. In another aspect, the output of the drilling control system is directly linked with rig instrumentation systems so as to provide a closed-loop automated drilling control system that optimizes drilling while taking into account the downhole dynamic behavior and surface parameters. The drilling models can be either static or dynamic. In one embodiment, the simulation of the drilling process uses neural networks to estimate some nonlinear function using the examples of input-output relations produced by the drilling process.

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